



Radius–Ulna (Forearm) Fractures in Dogs and Cats

Quick take

The **radius** and **ulna** are the two **long bones of the forelimb** between the elbow and the wrist (carpus). In dogs and cats, these bones usually fracture together after trauma (falls, being hit by a car, getting a leg caught, rough play, etc.).

Small-breed dogs (especially toy breeds) and cats are often affected.

Some simple, stable fractures can heal in a splint or cast, but **many radial–ulnar fractures are best treated surgically** – especially in **toy breeds, young animals**, and any **highly displaced or multiple-piece (comminuted) fracture**.

With proper repair and aftercare, **most pets regain excellent limb function**, but complications (like delayed healing or implant issues) do occur and are slightly more common in toy-breed radius/ulna fractures.

1) What's going on inside?

The radius carries most of the weight in the forearm, while the ulna runs alongside and helps form the elbow and carpus.

When a fracture occurs:

A **high-energy impact** (car, big fall) or low-energy trauma in fragile bone (toy breeds, kittens) causes the bone(s) to crack or break into pieces.

In most cases, **both radius and ulna break together**, because they act like a pair of splinted rods. The muscles around them contract, pulling the pieces out of alignment, and the pet cannot bear weight.



In toy-breed dogs (e.g., Chihuahua, Pomeranian, Yorkie, Italian Greyhound):

The **radius is relatively thin and has poorer blood supply**, which means it's **prone to delayed healing or non-union** if treated with splints alone.

That's why these fractures have a **reputation for being “tricky”** and why **surgeons often strongly recommend internal fixation (plates/screws)**.

In cats:

Bones are generally strong, but high falls (“high-rise syndrome”) can lead to mid-shaft or distal radius/ulna fractures, often with other injuries.

2) What owners notice

- Sudden non-weight-bearing front-leg lameness (holding the leg up)
- Swelling and pain in the forearm
- Leg hanging at an odd angle, or obvious deformity
- Pet won't use the leg, cries when touched, hides, or becomes aggressive from pain
- Sometimes small wounds or bleeding if the fracture is open

This is an emergency – fractures are rarely life-threatening by themselves, but the trauma that caused them may also have injured the chest, abdomen, or head.

3) Diagnosis & initial vet steps

Your vet will:

- Do a full physical exam to rule out life-threatening injuries first.
- Give pain relief quickly.

Take x-rays of the radius/ulna (and often elbow and carpus) to see:

- Fracture location (near elbow, mid-shaft, near carpus)
- Number of fragments
- Whether joints are involved
- Whether both bones are affected (usually yes)

Sometimes CT is used in complex fractures or joint involvement, and bloodwork helps plan anesthesia.

Based on the x-rays, your vet or surgeon will talk about:





- Whether splint/cast is an option
- Whether your pet really needs surgery (and what type)

4) Treatment options

A) Non-surgical (conservative) treatment

Used very selectively for radius/ulna:

- Stable, minimally displaced fractures in larger puppies or adult dogs or some cats.
- Anatomically “friendly” patterns (greenstick/incomplete fractures, some simple transverse fractures).
- Owners who can commit to very careful bandage care and multiple rechecks.

Approach:

- Splint or cast is applied to immobilize wrist and elbow.
- Strict rest and frequent bandage changes over 6–8+ weeks.
- Serial x-rays to confirm alignment and healing.

Limitations and risks:

- In toy breeds, non-surgical management has a **high risk of delayed union or non-union** – several studies report non-union rates of >20–40% for toy-breed radial fractures treated with casts alone. Orthopaedic texts and reviews therefore generally **recommend against splint-only treatment in these dogs**.
- **Bandage complications** (pressure sores, skin infections, loss of fracture alignment) are common if bandages are not monitored closely.

For most toy-breed dogs, and many displaced fractures in any dog or cat, surgery is the recommended standard of care.

B) Surgical management (gold standard for most cases)

Goals:

- Re-align the bone fragments precisely
- Provide rigid, stable fixation so the bone can heal
- Allow earlier, safer use of the limb and reduce the risk of non-union and deformity

Common surgical options:

1) Plate-and-screw fixation (most common, especially in dogs)

A **metal plate** is contoured to match the surface of the radius and secured with screws above and below the fracture.

The ulna may be left to heal on its own (if aligned) or also fixed depending on configuration.

In toy breeds, surgeons often use locking plates or specially designed 1.5–2.0 mm “toy-breed” plates to maximize stability in tiny bones.



Pros:

Very strong, rigid fixation
Good control of rotation and length
Well-documented healing rates; multiple studies report union rates >90–95% with plate fixation in toy-breed radial fractures when done properly.

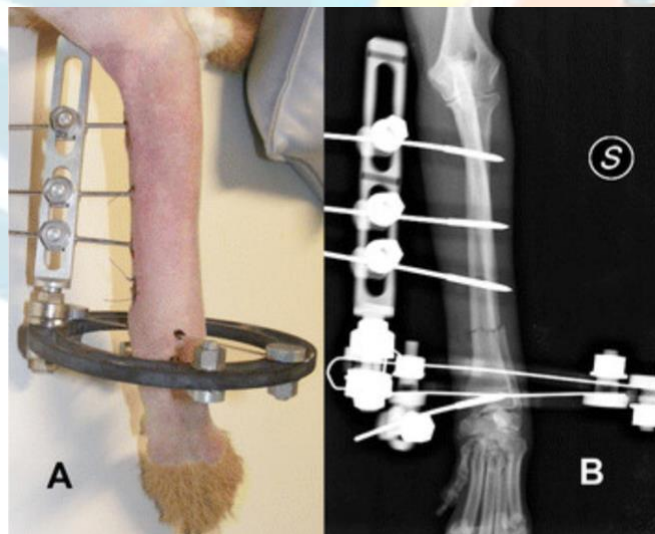
Cons:

Requires open surgery (soft tissues must be handled carefully to protect blood supply).
Higher initial cost than casting.

2) External skeletal fixation (ESF)

Pins are passed through the skin into the radius (and sometimes ulna) and connected externally with bars or acrylic ("ex-fix frame").

Good for open fractures, multiple fragments, or when soft tissues are damaged.
Also useful when minimal implants at the fracture site are desired.



Pros:



Strong stabilization without a big implant directly over the fracture line.
Adjustability post-op.

Cons:

Requires daily pin-site care at home.

Pin-tract irritation or infection is relatively common but usually manageable.

Cats, in particular, sometimes dislike the frame.

3) Hybrid or minimally invasive fixation

Combinations (plate + ESF) in very complex fractures.

Minimally invasive plate osteosynthesis (MIPO): plate is slid under the skin with small incisions, preserving blood supply.

These are increasingly used in specialty centres to improve healing and reduce soft-tissue trauma.

5) Why surgery with an experienced surgeon is especially important in toy-breed radial/ulnar fractures

Several peer-reviewed veterinary studies have shown:

- High non-union and malunion rates in toy-breed radius/ulna fractures treated with casts alone.
- Much better healing rates and long-term function with rigid internal fixation (plates/screws).
- Because of the thin bone and limited blood supply of the distal radius in these breeds, most orthopaedic surgeons now consider plate fixation (often locking plates) the treatment of choice whenever possible.

Bottom line:

If your tiny dog (Chihuahua, Yorkie, Pomeranian, Italian Greyhound, etc.) breaks its radius/ulna, surgery is usually strongly recommended, and “just a cast” is generally not a good option unless the fracture is extremely mild and your surgeon is comfortable with the plan.

Moreover, initial attempt with cast and later swap to plate osteosynthesis will inevitably affect the prognosis after rigid fixation. The best outcome is with surgery within the first 4 days.

6) What to expect around surgery

Pre-op:

Bloodwork and physical exam.

Possibly chest x-rays or ultrasound if trauma was significant.

Your pet will usually be fasted overnight (unless it's an emergency and timing is different).

The operation:

General anesthesia with monitoring.

Fracture is reduced (put back into alignment) and stabilized with the chosen method.

Bandage or soft padded dressing may be applied, but often the repair is stable enough that only a light dressing is used.

Hospital stay:

Most pets stay 1 night (sometimes same-day discharge; sometimes 2–3 days if trauma or pain is more severe).



Pain is managed with opioids, NSAIDs, and sometimes local anaesthetic blocks.

7) Recovery & rehab (what home care looks like)

Activity restriction

- Strict exercise restriction is critical: leash walks only for toilet breaks, no running, jumping, or playing with housemates.
- Typically **6–8 weeks** of strict rest for plate fixation, sometimes longer if healing is slow or fracture was severe.

Bandage & pin-site care

If a splint or cast is used after surgery, you'll need to:

- Keep it clean and dry
- Watch for swelling, smell, chewing, slipping
- Come in for regular rechecks/bandage changes
- For ESF, pin sites must be cleaned as directed by your vet. Mild crusting is normal; redness, discharge, or pain need prompt attention.

Follow-up x-rays

Usually taken at **4–6 weeks post-op**, and again later if needed, to confirm that the bone is healing and implants are stable.

Rehab

- Controlled leash walking gradually increased.
- Later, simple strengthening and range-of-motion exercises.
- Hydrotherapy or formal physiotherapy can be helpful in some cases, especially after severe trauma.

8) Complications – what can happen and how often

Exact percentages vary between studies, centres, and fracture complexity, but here are reasonable ranges from veterinary orthopedic literature.

With surgical fixation (plates/ESF)

- **Overall complication rate:** often reported around **10–25%** for radial-ulnar fractures, but most complications are minor or manageable, and union rates >90% are typical with proper technique.

Common issues:

- **Delayed union / non-union**

More common in toy breeds and in distal radius fractures.

Non-union rates with improper casting alone can be 20–40%+, whereas with modern plating techniques they're typically <10%.

May require revision surgery or bone graft.

- **Infection**

Superficial incisional infections: 5–10% – usually respond to antibiotics and local care.

Deep infections (involving bone/implants): rarer (<5%), but can require implant removal once the fracture has healed.

- **Implant problems**

Plate or screw loosening, failure, or breakage: <5–10%, often related to early over-activity, poor bone quality, or highly comminuted fractures.

ESF pin-tract irritation/infection is relatively common but usually minor.



▪ **Malalignment or deformity**

If reduction isn't perfect or if a fracture shifts (more an issue with splints or external fixation than plates), the forelimb can heal with varus/valgus deformity (bent inward/outward).

Mild deformities may be tolerated; severe ones may need corrective surgery.



▪ **Joint stiffness**

More common when joints were immobilized in a cast for a long time; often improves with use and physiotherapy.

With non-surgical splint/cast management

- Loss of fracture alignment as swelling changes or bandage loosens: common, especially if bandage checks are not frequent.
- Pressure sores, skin infection, and bandage sores: reported in up to 20–30% of cases in some series if bandages poorly managed.
- Malunion or non-union: particularly in toy breeds, ranges 20–40% or more depending on study and case selection.
- Requiring salvage surgery later often makes repair more difficult.

9) Prognosis – how well do dogs and cats recover?

Dogs



- For simple to moderately complex fractures treated surgically with plates or ESF, long-term limb function is generally excellent in >90% of dogs.
- Toy-breed dogs with distal radial fractures, once properly plated, usually return to near-normal use – many owners can't see a difference in everyday life.
- Severe **comminuted fractures**, **open fractures**, and those complicated by infection or non-union have a more guarded prognosis and may have mild, permanent stiffness or lameness.

Cats

- Cats are often excellent bone healers.
- With proper fixation, most regain normal forelimb function.
- They can be more acrobatic and prone to “cheating” on rest, so good confinement is important.

10) Long-term management & prevention tips

- Weight control: extra weight stresses healing bones and joints.
- Use non-slip flooring and baby gates/ramps to avoid jumps and falls, especially during recovery.
- Consider body harnesses rather than neck collars for leash walking.
- For high-rise cats, secure windows and balconies (screens, nets) to prevent future falls.
- For toy-breed dogs, be cautious about kids handling them, jumping off furniture, and rough play with big dogs.

Once healed, most pets do not need long-term meds and can **live completely normal lives**.

11) Selected veterinary references

- ACVS (American College of Veterinary Surgeons) – client pages on Fractures of the Radius and Ulna and Fracture Repair Options (internal fixation vs external coaptation).
- VCA Animal Hospitals – “Fractures in Dogs and Cats” and toy-breed forelimb fracture articles.
- Small Animal Orthopaedics textbooks (e.g., Fossum, Brinker, Piermattei & Flo) – chapters on toy-breed radial fractures and fixation choices.
- Specialty hospital blogs/handouts (e.g., university veterinary hospitals) that discuss toy-breed radius/ulna fractures and why surgery is recommended.

Bottom line for pet owners

Radius–ulna fractures are very treatable; the main challenge is choosing the right fixation method for your pet's size, bone quality, and fracture type.

For most dogs and cats – especially toy-breed dogs – surgical repair with plates (or ESF) offers the best chance of rapid, reliable healing and normal limb function, with **union rates generally >90%** and manageable complication rates.

Non-surgical management with splints can work in selected cases, but carries **significantly higher risks of non-union and deformity in small-breed dogs**.

With good surgery, careful aftercare, and a bit of patience, most pets are soon back to their normal active lives.